

16 -05- 2005

14

CLAIMS

1. A method for controlling a continuous metal removal in conjunction with a zinc preparation process, in which the metal removal is performed in
5 one or more reactors, in conjunction with the reactor, the redox potential and the acidity and/or basicity are measured, and the process variables of the metal removal are adjusted towards the desired direction based on the measurement results,
10 characterised in that the measurements of the redox potential are performed from the sludge produced in the reactor outside the reactor vessel, and the acidity and/or basicity of the reactor solution is determined by means of the BT value, and
15 the measuring instrument of the redox potential is purified at predetermined intervals.

2. The method as defined in claim 1, characterised in that the solid matter content of the reactor solution is determined and
20 adjusted to be suitable.

3. The method as defined in claim 1 or 2, characterised in that based on the measurement results, the introduction of zinc powder into the metal removal reactor is adjusted.

25 4. The method as defined in any one of claims 1-3, characterised in that based on the measurement results, the redox potential of the sludge, the acidity/basicity of the solution, the solid matter content of the solution and/or the
30 temperature of the reactor are adjusted.

5. The method as defined in any one of claims 1-4, characterised in that the metal removal is performed at least in two reactors connected in serial.

35 6. The method as defined in any one of claims 1-5, characterised in that the measuring instrument of the redox potential is arranged in

16-05-2005

15

conjunction with the outlet pipe of the reactor or in conjunction with the connecting pipe between the reactors.

5 7. The method as defined in any one of claims 1-6, characterised in that the measuring instrument of acidity and/or basicity is arranged in conjunction with the reactor vessel.

10 8. The method as defined in any one of claims 1-7, characterised in that the measurement of the redox potential is performed using a measurement electrode.

9. The method as defined in any one of claims 1-8, characterised in that the metal removal is cobalt removal.

15 10. The method as defined in any one of claims 1-9, characterised in that the measuring instrument is regularly washed, preferably at intervals of 1-2 hours.

20 11. The method as defined in any one of claims 1-10, characterised in that in conjunction with each reactor, measurements are performed that control the adjustment of the desired process variable, for each reactor specifically.

25 12. An apparatus for controlling a continuous metal removal in conjunction with a zinc preparation process, in which the metal removal is performed in one or more reactors (11a-c), the apparatus comprising at least one measuring instrument (16a-c) for measuring the redox potential and acidity and/or
30 basicity in conjunction with the reactor, at least one adjustment device (17a-c) for adjusting the process variables of the metal removal towards the desired direction based on the measurement results, and at least one control device for forwarding the
35 measurement results from the measuring instrument (16a-c) to the adjustment device (17a-c), characterised in that the measuring

16 -05- 2005

16

instrument of the redox potential (16a-c) is arranged outside the reactor vessel, and is placed in conjunction with the pipe connected to the reactor, via which pipe the sludge produced in the reactor flows out, and the apparatus comprises a determination device of BT value for determining the acidity and/or basicity of the reactor solution, and the apparatus comprises purification means for purifying the measuring instrument of the redox potential at predetermined intervals.

13. The apparatus as defined in claim 12, characterised in that the apparatus comprises a feeding device (17a-c) for introducing zinc powder into the metal removal reactor (11a-c), and the feeding device is connected to the adjustment and/or control device.

14. The apparatus as defined in claim 12 or 13, characterised in that the measuring instrument (16a-c) of the redox potential is arranged in conjunction with the connecting pipe between the reactors.

15. The apparatus as defined in any one of claims 12-14, characterised in that the measuring instrument of acidity and/or basicity is arranged in conjunction with the reactor vessel.

16. The apparatus as defined in any one of claims 12-15, characterised in that the measuring instrument (16a-c) of the redox potential comprises at least one measurement electrode.

17. The use of an apparatus as defined in any one of claims 12-16 in a cobalt removing process.